In [1]:

```
import pandas as pd
import matplotlib.pyplot as plt
import numpy as np
import seaborn as sns
```

In [2]:

```
data = pd.read_csv("main_data.csv")
```

In [4]:

```
pre_event_data = data.iloc[:, 2:9]
post_event_data =  pd.concat([data.iloc[:, 2:5], data.iloc[:, 9:]], axis = 1)
```

In [5]:

```
Gender = {0:"Male",1:"Female"}
Maritial_status = {0:"Unmarried",1:"Married",2:"Seprated",3:"Widow",4:"Hermit"}
```

In [6]:

```
plt.figure(figsize=(12, 8))

plt.subplot(2, 2, 1)
Maritial_status_data = pre_event_data["Marital Status"].value_counts()
Labels = [Maritial_status[x] for x in Maritial_status_data.keys()]
plt.pie(Maritial_status_data.values,labels=Labels,autopct='%1.1f%%')
plt.title("Distribution of data on the basis of Marital Status")
plt.legend(loc='upper right')

plt.subplot(2, 2, 2)
gender_data = pre_event_data["Gender"].value_counts()
Labels = [Gender[x] for x in gender_data.keys()]
plt.pie(gender_data.values,labels=Labels,autopct='%1.1f%%')
plt.title("Distribution of data on the basis of Gender")
plt.legend(loc='upper right')

plt.subplot(2, 1, 2)
age_data = {"Young":0,"Middle_age":0,"Senior_citizen":0}
for age in pre_event_data["Age"]:
    if age>=18 and age<30: age_data["Young"]+=1
    elif age>=30 and age<50: age_data["Middle_age"]+=1
    else: age_data["Senior_citizen"]+=1

plt.pie(age_data.values(),labels=age_data.keys(),autopct='%1.1f%%')
plt.title("Distribution of data on the basis of Age")
plt.legend(loc='upper right')

plt.tight_layout()
plt.show()
```

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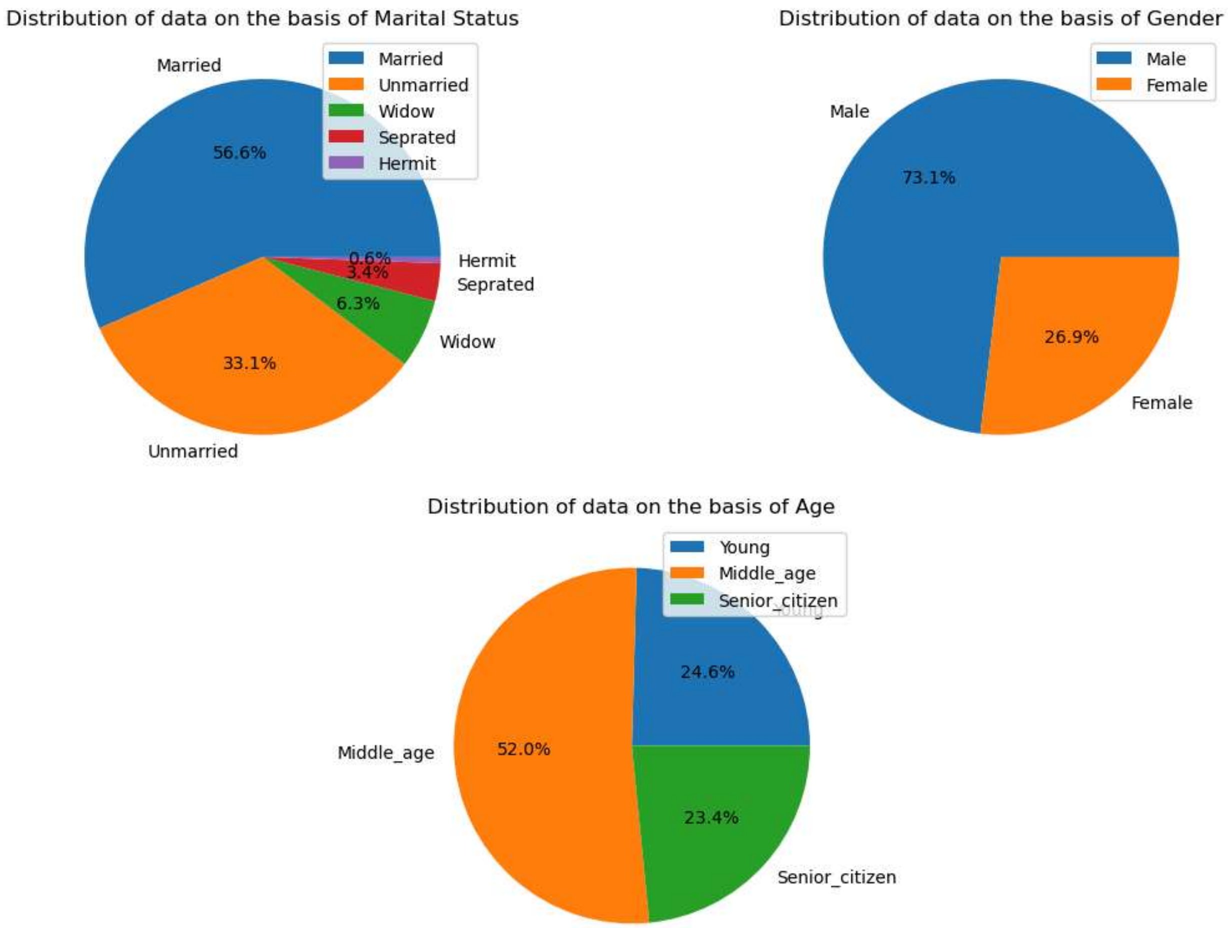

```
In [7]: def physical_health_div(mode,column):
            physical_health = []
            if mode == "pre": iterator = pre_event_data[column]
            if mode == "post": iterator = post_event_data[column]
            for points in iterator:
                if points>=0 and points<25: physical_health.append("Very_lazy")
                elif points>=25 and points<30: physical_health.append('Lazy')
                elif points>=30 and points<35: physical_health.append('Satisfactory')
                elif points>=35 and points<40: physical_health.append('Active')
                else: physical_health.append('Very_active')
            return physical_health
```

```
In [8]: plt.figure(figsize=(12, 8))
        plt.subplot(2, 2, 1)
        plt.suptitle("Comparision of physical health on the basis of gender",fontsize=15)
        color_dic = {"Very_active": "C0", "Active": "C1", "Satisfactory": "C2", "Lazy": "C3",'
        order = ["Very_active", "Active", "Satisfactory", "Lazy","Very_lazy"]
        physical_health_data_pre = {"Gender": pre_event_data["Gender"],"Physical Health":physi
        physical_health_data_pre = pd.DataFrame(physical_health_data_pre)
        fig = sns.countplot(x="Gender", data=physical_health_data_pre,  hue='Physical Health',
        fig.set_ylim([0,70])
        fig.set_title('Pre Event')
        fig.set_xticklabels(["Male","Female"])

        plt.subplot(2, 2, 2)
        physical_health_data_post = {"Gender": post_event_data["Gender"],"Physical Health":phy
        physical_health_data_post = pd.DataFrame(physical_health_data_post)
        fig = sns.countplot(x="Gender", data=physical_health_data_post, hue='Physical Health',
```

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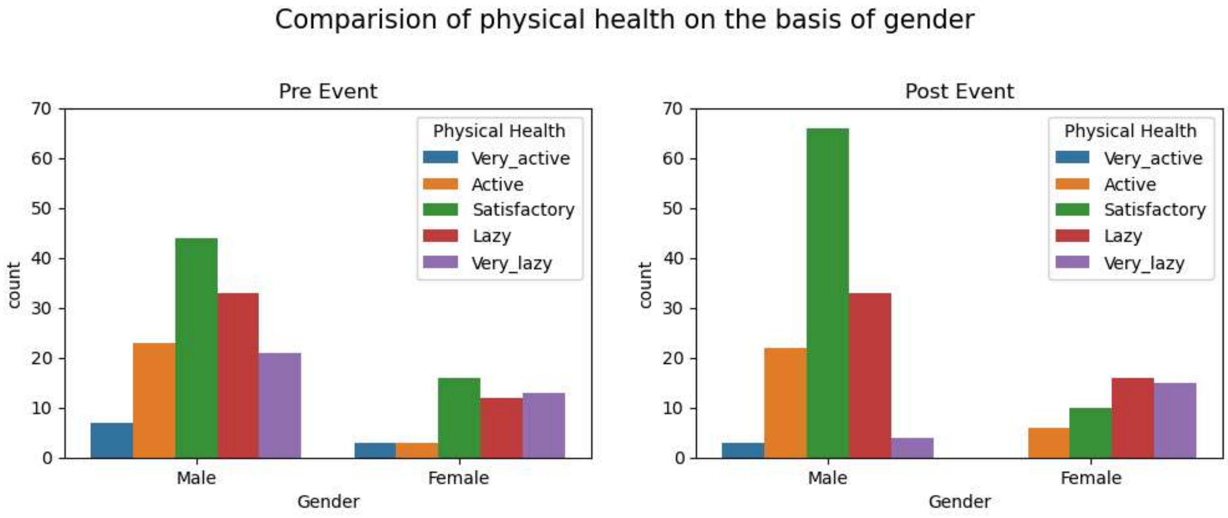
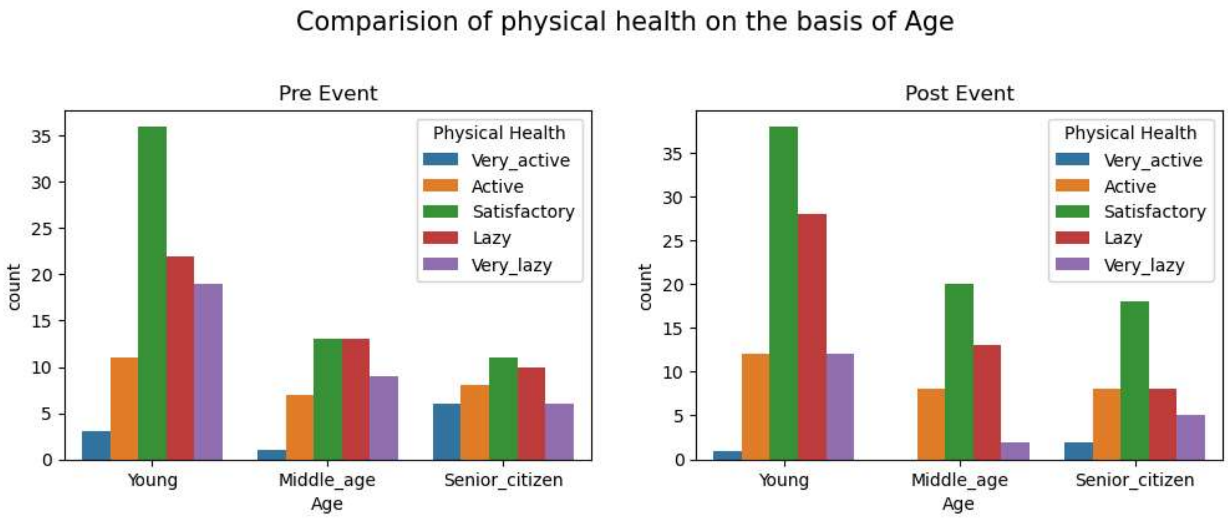
```
fig.set_title('Post Event')
fig.set_ylim([0,70])
fig.set_xticklabels(["Male","Female"])
plt.show()
```

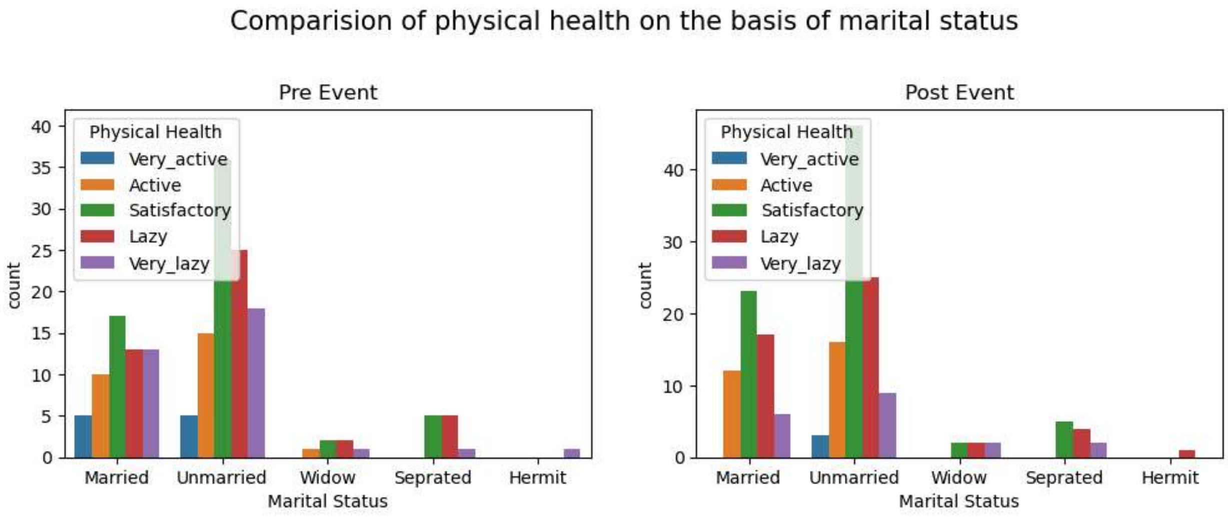


In [9]:

```
age_div = []
for age in pre_event_data["Age"]:
    if age>=18 and age<30: age_div.append("Young_age")
    elif age>=30 and age<50: age_div.append("Middle_age")
    else: age_div.append("Senior_citizen")

color_dic = {"Very_active": "C0", "Active": "C1", "Satisfactory": "C2", "Lazy": "C3",'
order = ["Very_active", "Active", "Satisfactory", "Lazy","Very_lazy"]
plt.figure(figsize=(12, 8))
plt.subplot(2, 2, 1)
plt.suptitle("Comparision of physical health on the basis of Age",fontsize=15)
physical_health_data_pre = {"Age":age_div,"Physical Health":physical_health_div("pre",
physical_health_data_pre = pd.DataFrame(physical_health_data_pre)
fig = sns.countplot(x="Age", data=physical_health_data_pre, palette=color_dic ,hue='Ph
fig.set_title('Pre Event')
fig.set_xticklabels(["Young","Middle_age","Senior_citizen"])

plt.subplot(2, 2, 2)
physical_health_data_post = {"Age": age_div,"Physical Health":physical_health_div("pos
physical_health_data_post = pd.DataFrame(physical_health_data_post)
fig = sns.countplot(x="Age", data=physical_health_data_post, palette=color_dic ,hue='P
fig.set_title('Post Event')
fig.set_xticklabels(["Young","Middle_age","Senior_citizen"])
plt.show()
```



```
In [10]: plt.figure(figsize=(12, 8))
         plt.subplot(2, 2, 1)
         plt.suptitle("Comparision of physical health on the basis of marital status",fontsize=
         color_dic = {"Very_active": "C0", "Active": "C1", "Satisfactory": "C2", "Lazy": "C3",'
         order = ["Very_active", "Active", "Satisfactory", "Lazy","Very_lazy"]
         physical_health_data_pre = {"Marital Status":pre_event_data["Marital Status"],"Physica
         physical_health_data_pre = pd.DataFrame(physical_health_data_pre)
         fig = sns.countplot(x="Marital Status", data=physical_health_data_pre, palette=color_c
         fig.set_ylim([0,42])
         fig.set_title('Pre Event')
         fig.set_xticklabels(["Married","Unmarried","Widow","Seprated","Hermit"])

         plt.subplot(2, 2, 2)
         physical_health_data_post = {"Marital Status":post_event_data["Marital Status"],"Physi
         physical_health_data_post = pd.DataFrame(physical_health_data_post)
         fig = sns.countplot(x="Marital Status", data=physical_health_data_post, palette=color_
         fig.set_title('Post Event')
         fig.set_xticklabels(["Married","Unmarried","Widow","Seprated","Hermit"])
         plt.show()
```



```
In [11]: def psychiological_health_div(mode,column):
             psychiological_health = []
             if mode == "pre": iterator = pre_event_data[column]
             if mode == "post": iterator = post_event_data[column]
                              in iterator:
```

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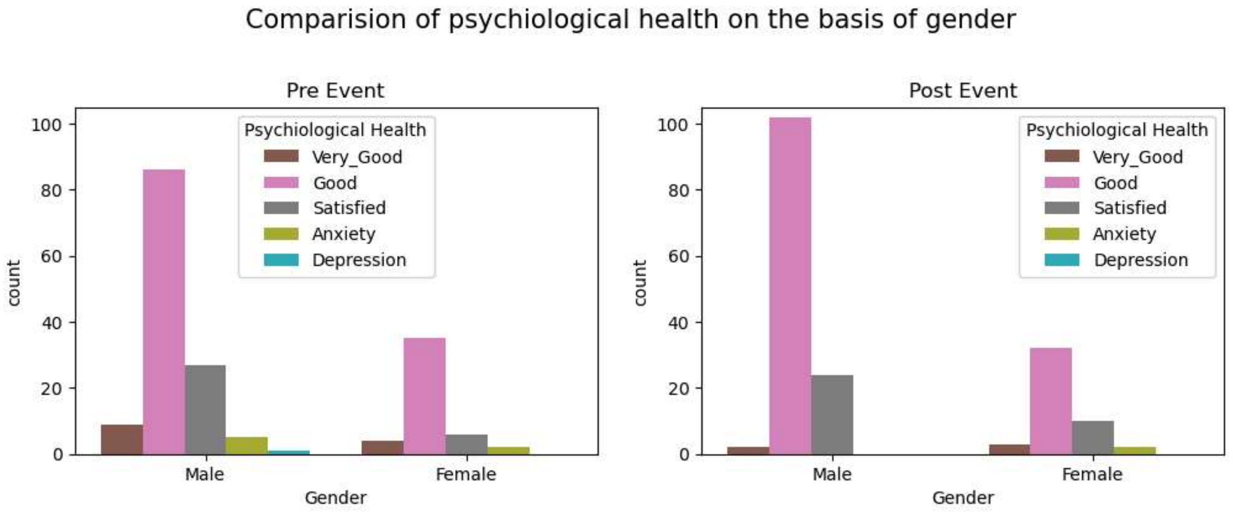
```
        if points>=0 and points<15: psychiological_health.append("Depression")
        elif points>=15 and points<20: psychiological_health.append('Anxiety')
        elif points>=20 and points<25: psychiological_health.append('Satisfied')
        elif points>=25 and points<35: psychiological_health.append('Good')
        else: psychiological_health.append('Very_Good')
    return psychiological_health

color_dic = {"Very_Good": "C5", "Good": "C6", "Satisfied": "C7", "Anxiety": "C8","Depr
order = ["Very_Good", "Good", "Satisfied", "Anxiety","Depression"]
```

In [12]:

```
plt.figure(figsize=(12, 8))
plt.subplot(2, 2, 1)
plt.suptitle("Comparision of psychiological health on the basis of gender",fontsize=15
psychiological_health_data_pre = {"Gender": pre_event_data["Gender"],"Psychiological H
psychiological_health_data_pre = pd.DataFrame(psychiological_health_data_pre)
fig = sns.countplot(x="Gender", data=psychiological_health_data_pre, palette=color_dic
fig.set_ylim([0,105])
fig.set_title('Pre Event')
fig.set_xticklabels(["Male","Female"])

plt.subplot(2, 2, 2)
psychiological_health_data_post = {"Gender": post_event_data["Gender"],"Psychiological
psychiological_health_data_post = pd.DataFrame(psychiological_health_data_post)
fig = sns.countplot(x="Gender", data=psychiological_health_data_post, palette=color_di
fig.set_ylim([0,105])
fig.set_title('Post Event')
fig.set_xticklabels(["Male","Female"])
plt.show()
```



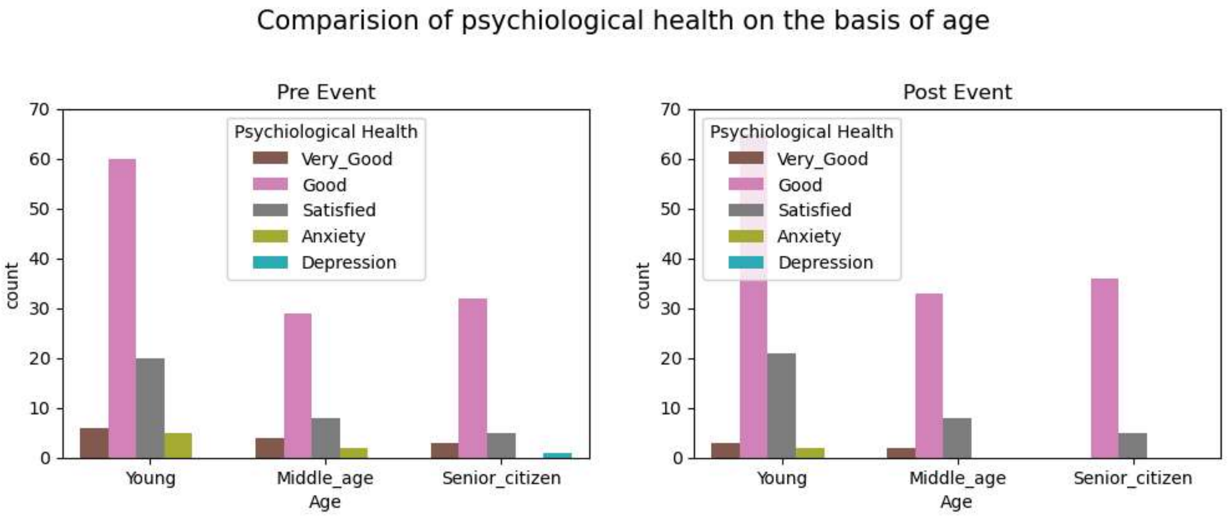
In [13]:

```
age_div = []
for age in pre_event_data["Age"]:
    if age>=18 and age<30: age_div.append("Young_age")
    elif age>=30 and age<50: age_div.append("Middle_age")
    else: age_div.append("Senior_citizen")



plt.figure(figsize=(12, 8))
plt.subplot(2, 2, 1)
plt.suptitle("Comparision of psychiological health on the basis of age",fontsize=15)
psychiological_health_data_pre = {"Age":age_div,"Psychiological Health":psychiological
psychiological_health_data_pre = pd.DataFrame(psychiological_health_data_pre)
Loading [MathJax]/extensions/Safe.js plot(x="Age", data=psychiological_health_data_pre, palette=color_dic ,h
fig.set_ylim([0,70])
fig.set_title('Pre Event')
fig.set_xticklabels(["Young","Middle_age","Senior_citizen"])

plt.subplot(2, 2, 2)
psychiological_health_data_post = {"Age": age_div,"Psychiological Health":psychiologic
psychiological_health_data_post = pd.DataFrame(psychiological_health_data_post)
fig = sns.countplot(x="Age", data=psychiological_health_data_post, palette=color_dic ,
fig.set_ylim([0,70])
fig.set_title('Post Event')
fig.set_xticklabels(["Young","Middle_age","Senior_citizen"])
plt.show()
```


Comparision of psychiological health on the basis of age

In [14]:

```
plt.figure(figsize=(12, 8))
plt.subplot(2, 2, 1)
plt.suptitle("Comparision of psychiological health on the basis of marital status",for
psychiological_health_data_pre = {"Marital Status":pre_event_data["Marital Status"],"F
psychiological_health_data_pre = pd.DataFrame(psychiological_health_data_pre)
fig = sns.countplot(x="Marital Status", data=psychiological_health_data_pre, palette=c
fig.set_ylim([0,80])
fig.set_title('Pre Event')
fig.set_xticklabels(["Married","Unmarried","Widow","Seprated","Hermit"])

plt.subplot(2, 2, 2)
psychiological_health_data_post = {"Marital Status":post_event_data["Marital Status"],
psychiological_health_data_post = pd.DataFrame(psychiological_health_data_post)
fig = sns.countplot(x="Marital Status", data=psychiological_health_data_post, palette=
fig.set_title('Post Event')
fig.set_xticklabels(["Married","Unmarried","Widow","Seprated","Hermit"])
plt.show()
```

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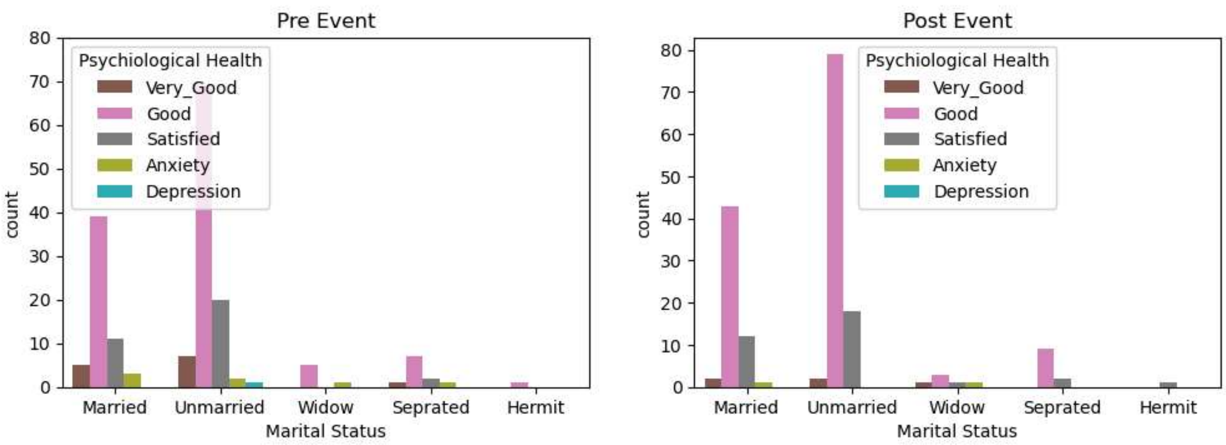
Comparision of psychiological health on the basis of marital status



In [15]:

```
def social_relationships_div(mode,column):
    social_relationships = []
    if mode == "pre": iterator = pre_event_data[column]
    if mode == "post": iterator = post_event_data[column]
    for points in iterator:
        if points>=0 and points<5: social_relationships.append("Introvert")
        elif points>=5 and points<10: social_relationships.append('Social')
        else: social_relationships.append('Extrovert')
    return social_relationships

color_dic = {"Extrovert":"C3","Social":"C5","Introvert":"C7"}
order = ["Extrovert","Social","Introvert"]
```

In [16]:

```
plt.figure(figsize=(12, 8))
plt.subplot(2, 2, 1)
plt.suptitle("Comparision of social relationships on the basis of gender",fontsize=15)
social_relationships_data_pre = {"Gender": pre_event_data["Gender"],"Social Relationsh
social_relationships_data_pre = pd.DataFrame(social_relationships_data_pre)
fig = sns.countplot(x="Gender", data=social_relationships_data_pre, palette=color_dic,
fig.set_title('Pre Event')
fig.set_xticklabels(["Male","Female"])

plt.subplot(2, 2, 2)
social_relationships_data_post = {"Gender": post_event_data["Gender"],"Social Relatior
social_relationships_data_post = pd.DataFrame(social_relationships_data_post)
fig = sns.countplot(x="Gender", data=social_relationships_data_post, palette=color_dic
fig.set_title('Post Event')
fig.set_xticklabels(["Male","Female"])
plt.show()
```

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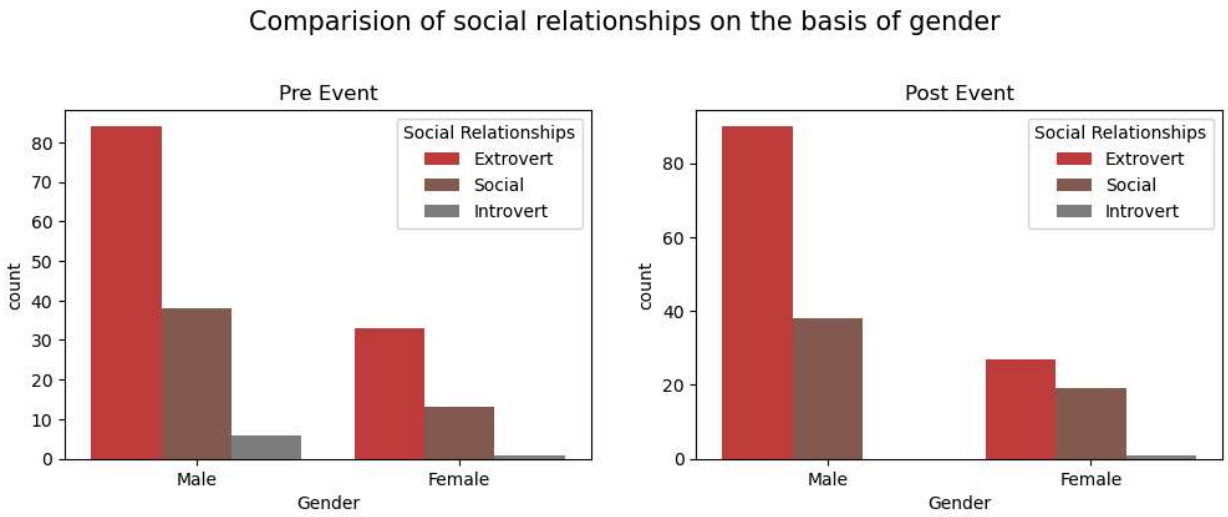
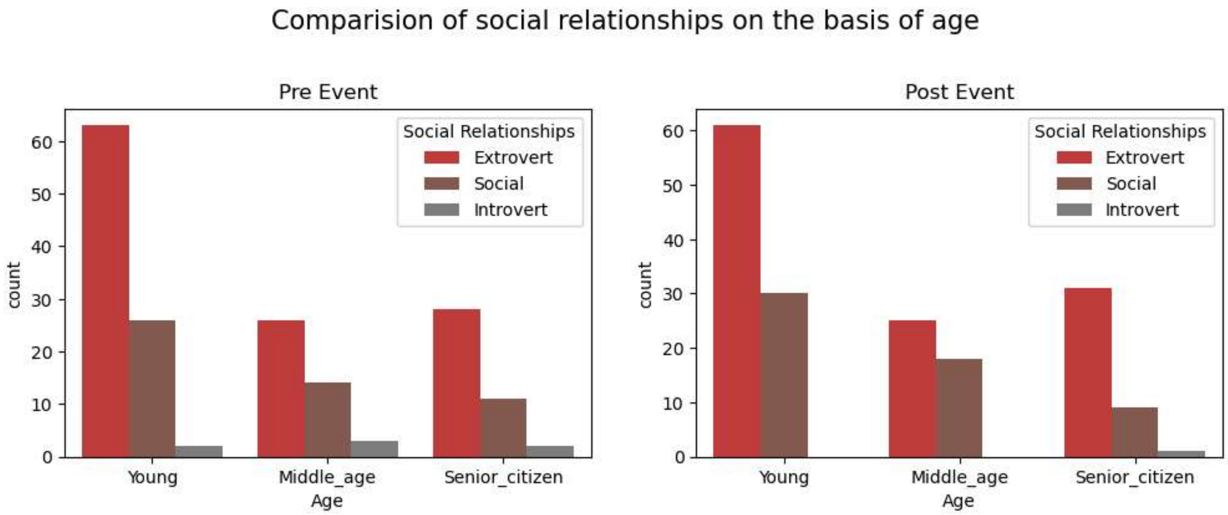
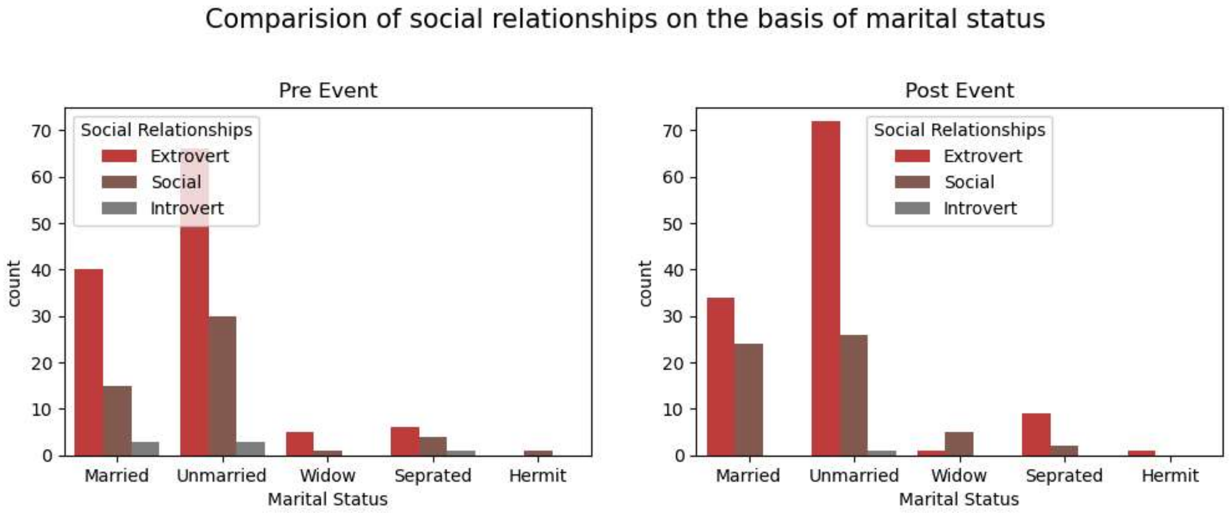


```
In [17]: age_div = []
         for age in pre_event_data["Age"]:
             if age>=18 and age<30: age_div.append("Young_age")
             elif age>=30 and age<50: age_div.append("Middle_age")
             else: age_div.append("Senior_citizen")


         plt.figure(figsize=(12, 8))
         plt.subplot(2, 2, 1)
         plt.suptitle("Comparision of social relationships on the basis of age",fontsize=15)
         social_relationships_data_pre = {"Age":age_div,"Social Relationships":social_relations
         social_relationships_data_pre = pd.DataFrame(social_relationships_data_pre)
         fig = sns.countplot(x="Age", data=social_relationships_data_pre, palette=color_dic,hue
         fig.set_title('Pre Event')
         fig.set_xticklabels(["Young","Middle_age","Senior_citizen"])

         plt.subplot(2, 2, 2)
         social_relationships_data_post = {"Age": age_div,"Social Relationships":social_relatic
         social_relationships_data_post = pd.DataFrame(social_relationships_data_post)
         fig = sns.countplot(x="Age", data=social_relationships_data_post, palette=color_dic,hu
         fig.set_title('Post Event')
         fig.set_xticklabels(["Young","Middle_age","Senior_citizen"])
         plt.show()
```



In [18]:

```
plt.figure(figsize=(12, 8))
plt.subplot(2, 2, 1)
plt.suptitle("Comparision of social relationships on the basis of marital status",font
social_relationships_data_pre = {"Marital Status":pre_event_data["Marital Status"],"Sc
social_relationships_data_pre = pd.DataFrame(social_relationships_data_pre)
fig = sns.countplot(x="Marital Status", data=social_relationships_data_pre, palette=cc
fig.set_ylim([0,75])
fig.set_title('Pre Event')
fig.set_xticklabels(["Married","Unmarried","Widow","Seprated","Hermit"])

plt.subplot(2, 2, 2)
social_relationships_data_post = {"Marital Status":post_event_data["Marital Status"],'
social_relationships_data_post = pd.DataFrame(social_relationships_data_post)
fig = sns.countplot(x="Marital Status", data=social_relationships_data_post, palette=c
fig.set_ylim([0,75])
fig.set_title('Post Event')
fig.set_xticklabels(["Married","Unmarried","Widow","Seprated","Hermit"])
plt.show()
```



In [19]:

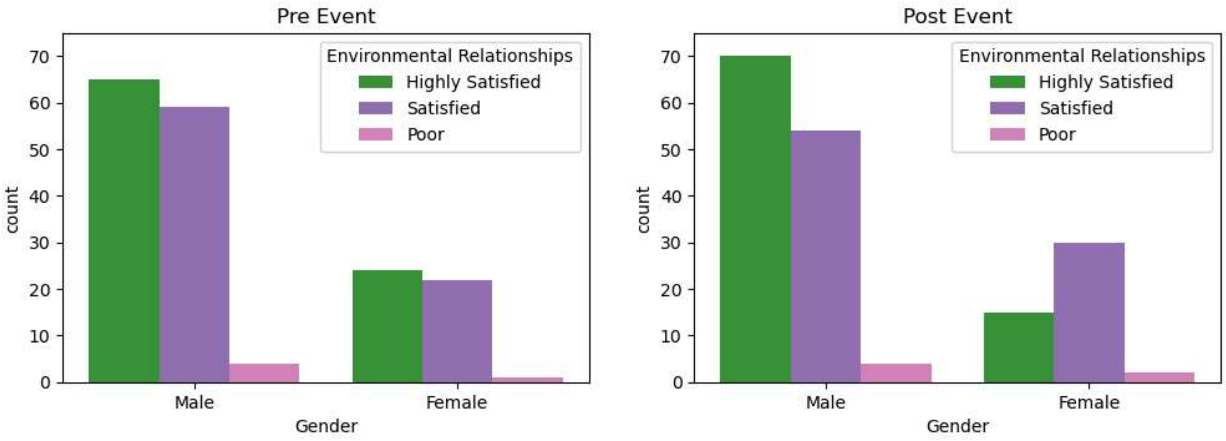
```
def environmental_relationships_div(mode,column):
    environmental_relationships = []
    if mode == "pre": iterator = pre_event_data[column]
    if mode == "post": iterator = post_event_data[column]
    for points in iterator:
        if points>=0 and points<10: environmental_relationships.append("Poor")
        elif points>=10 and points<20: environmental_relationships.append('Satisfied')
        else: environmental_relationships.append('Highly Satisfied')
    return environmental_relationships

color_dic = {"Highly Satisfied":"C2","Satisfied":"C4","Poor":"C6"}
order = ["Highly Satisfied","Satisfied","Poor"]
```

In [20]:

```
plt.figure(figsize=(12, 8))
plt.subplot(2, 2, 1)
plt.suptitle("Comparision of environmental relationships on the basis of gender",fonts
environmental_relationships_data_pre = {"Gender": pre_event_data["Gender"],"Environmen
environmental_relationships_data_pre = pd.DataFrame(environmental_relationships_data_p
fig = sns.countplot(x="Gender", data=environmental_relationships_data_pre, palette=col
fig.set_ylim([0,75])
fig.set_title('Pre Event')
Loading [MathJax]/extensions/Safe.js bels(["Male","Female"])
```

```
plt.subplot(2, 2, 2)
environmental_relationships_data_post = {"Gender": post_event_data["Gender"],"Environm
environmental_relationships_data_post = pd.DataFrame(environmental_relationships_data_
fig = sns.countplot(x="Gender", data=environmental_relationships_data_post, palette=co
fig.set_ylim([0,75])
fig.set_title('Post Event')
fig.set_xticklabels(["Male","Female"])
plt.show()
```

Comparision of environmental relationships on the basis of gender



In [21]:

```
age_div = []
for age in pre_event_data["Age"]:
    if age>=18 and age<30: age_div.append("Young_age")
    elif age>=30 and age<50: age_div.append("Middle_age")
    else: age_div.append("Senior_citizen")


plt.figure(figsize=(12, 8))

plt.subplot(2, 2, 1)
plt.suptitle("Comparision of environmental relationships on the basis of age",fontsize
environmental_relationships_data_pre = {"Age":age_div,"Environmental Relationships":er
environmental_relationships_data_pre = pd.DataFrame(environmental_relationships_data_p
fig = sns.countplot(x="Age", data=environmental_relationships_data_pre, palette=color_
fig.set_title('Pre Event')
fig.set_xticklabels(["Young","Middle_age","Senior_citizen"])

plt.subplot(2, 2, 2)
environmental_relationships_data_post = {"Age": age_div,"Environmental Relationships":
environmental_relationships_data_post = pd.DataFrame(environmental_relationships_data_
fig = sns.countplot(x="Age", data=environmental_relationships_data_post, palette=color
fig.set_ylim([0,50])
fig.set_title('Post Event')
fig.set_xticklabels(["Young","Middle_age","Senior_citizen"])
plt.show()
```

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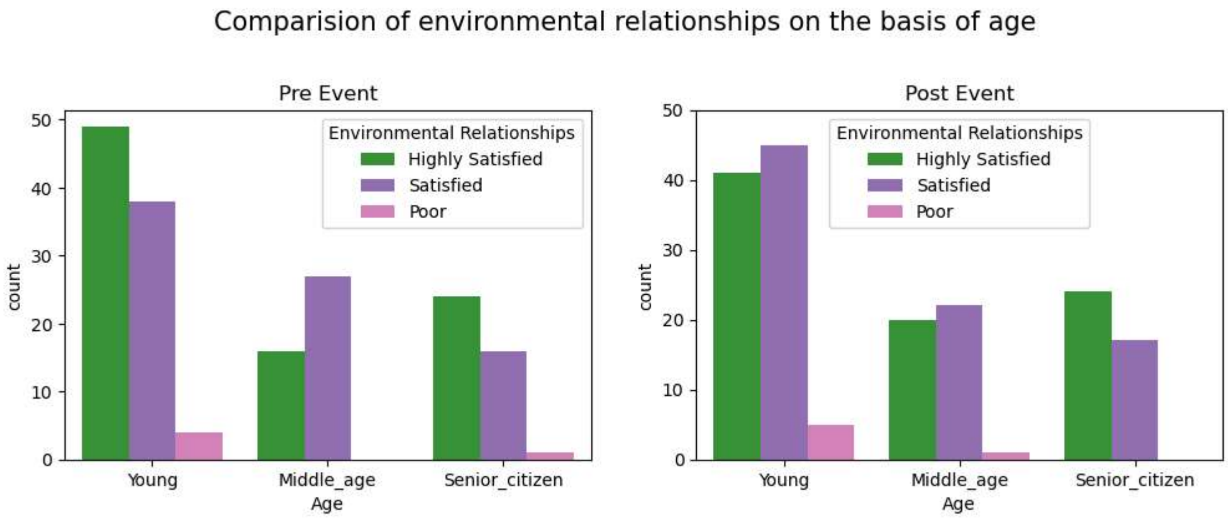
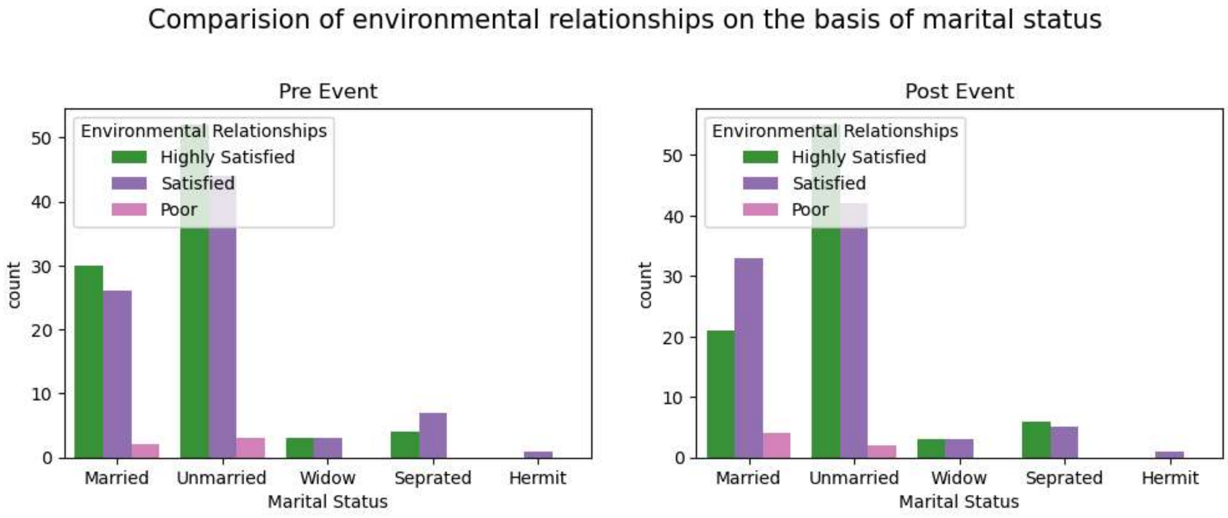


In [23]:

```
plt.figure(figsize=(12, 8))
plt.subplot(2, 2, 1)
plt.suptitle("Comparision of environmental relationships on the basis of marital statu
environmental_relationships_data_pre = {"Marital Status":pre_event_data["Marital Statu
environmental_relationships_data_pre = pd.DataFrame(environmental_relationships_data_p
fig = sns.countplot(x="Marital Status", data=environmental_relationships_data_pre, pal
fig.set_title('Pre Event')
fig.set_xticklabels(["Married","Unmarried","Widow","Seprated","Hermit"])

plt.subplot(2, 2, 2)
environmental_relationships_data_post = {"Marital Status":post_event_data["Marital Sta
environmental_relationships_data_post = pd.DataFrame(environmental_relationships_data_
fig = sns.countplot(x="Marital Status", data=environmental_relationships_data_post, pa
fig.set_title('Post Event')
fig.set_xticklabels(["Married","Unmarried","Widow","Seprated","Hermit"])
plt.show()
```



In [24]:

```
from collections import Counter
```

In [26]:

```
data_psychiological_health_1 = psychiological_health_div("pre","Psychiological Health"
data_physical_health_1 = physical_health_div("pre","Physical Health")
data_social_relationships_1 = social_relationships_div("pre","Social Relationships")
data_environmental_relationships_1 = environmental_relationships_div("pre","Environmer
                         ata_psychiological_health_1))
print(Counter(data_physical_health_1))
```

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```
print(Counter(data_social_relationships_1))
print(Counter(data_environmental_relationships_1))
```

```
Counter({'Good': 121, 'Satisfied': 33, 'Very_Good': 13, 'Anxiety': 7, 'Depression':
1})
Counter({'Satisfactory': 60, 'Lazy': 45, 'Very_lazy': 34, 'Active': 26, 'Very_activ
e': 10})
Counter({'Extrovert': 117, 'Social': 51, 'Introvert': 7})
Counter({'Highly Satisfied': 89, 'Satisfied': 81, 'Poor': 5})
```

In [28]:

```
data_psychiological_health_2 = psychiological_health_div("post","Psychiological Healtl
data_physical_health_2 = physical_health_div("post","Physical Health.1")
data_social_relationships_2 = social_relationships_div("post","Social Relationships.1"
data_environmental_relationships_2 = environmental_relationships_div("post","Environme
print(Counter(data_psychiological_health_2))
print(Counter(data_physical_health_2))
print(Counter(data_social_relationships_2))
print(Counter(data_environmental_relationships_2))
```

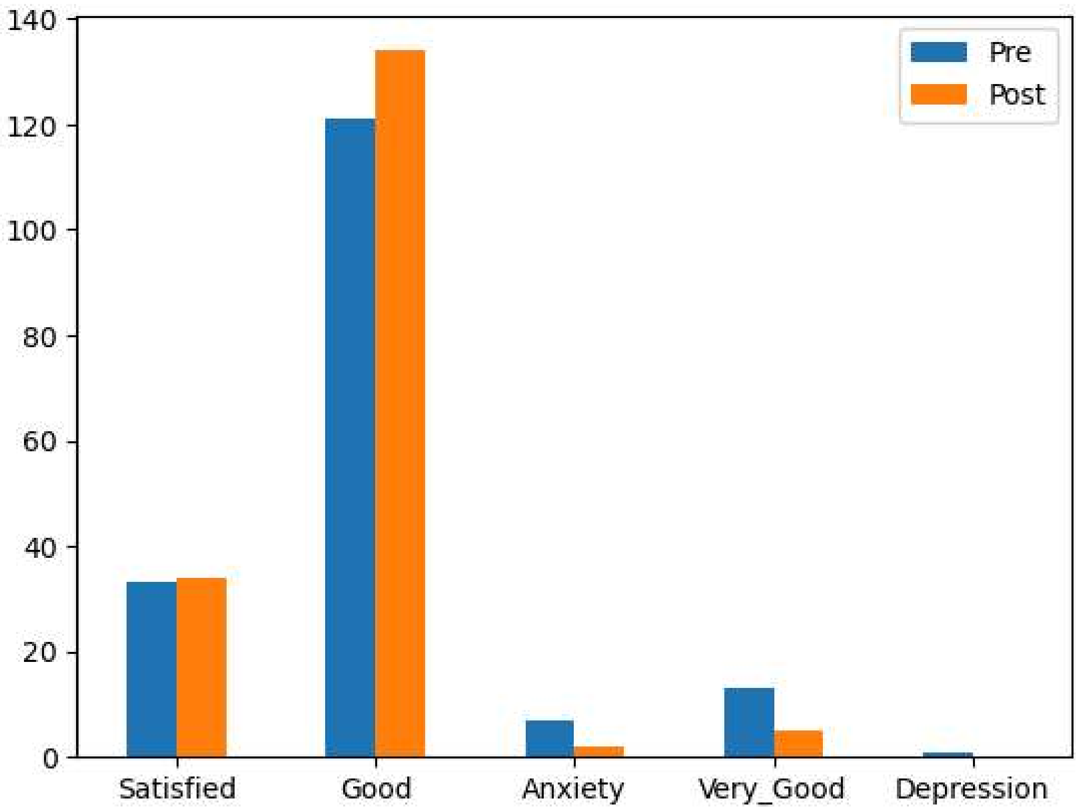
```
Counter({'Good': 134, 'Satisfied': 34, 'Very_Good': 5, 'Anxiety': 2})
Counter({'Satisfactory': 76, 'Lazy': 49, 'Active': 28, 'Very_lazy': 19, 'Very_activ
e': 3})
Counter({'Extrovert': 117, 'Social': 57, 'Introvert': 1})
Counter({'Highly Satisfied': 85, 'Satisfied': 84, 'Poor': 6})
```

In [29]:

```
psychiological_table = pd.DataFrame({"Pre":Counter(data_psychiological_health_1),"Post
psychiological_table.plot.bar(rot=0)
```

Out[29]:

```
<AxesSubplot:>
```



In [30]:

```
physical_table = pd.DataFrame({"Pre":Counter(data_physical_health_1),"Post":Counter(da
physical_table.plot.bar(rot=0)
```

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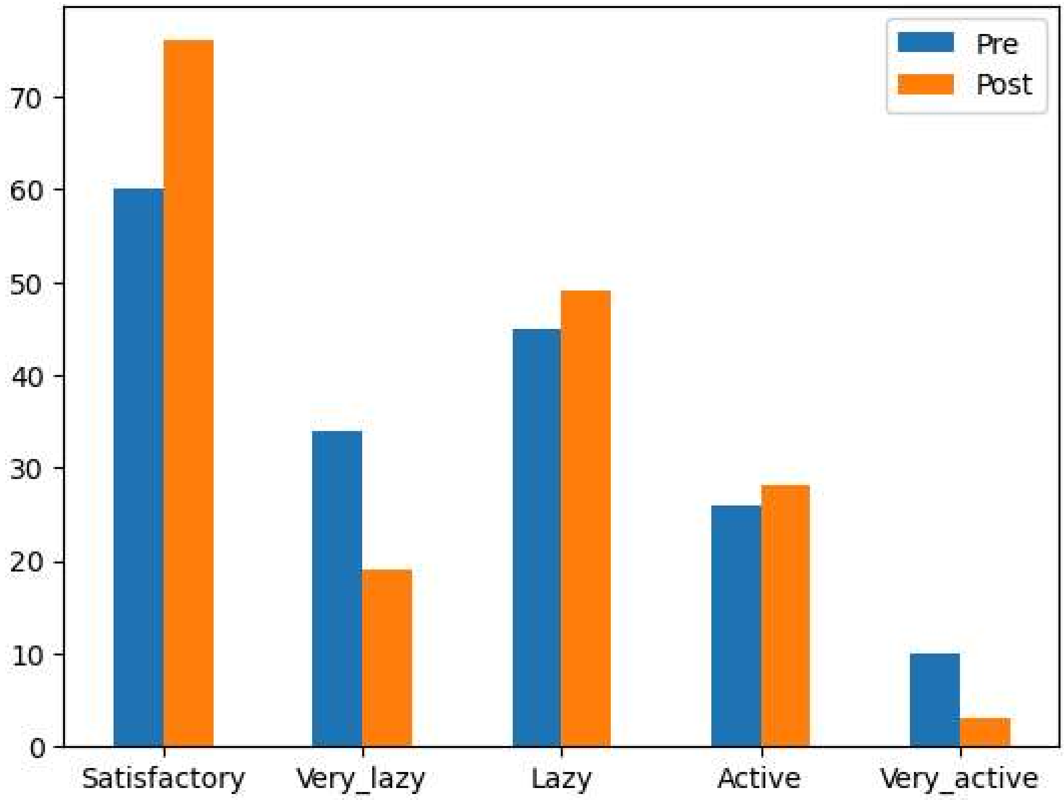
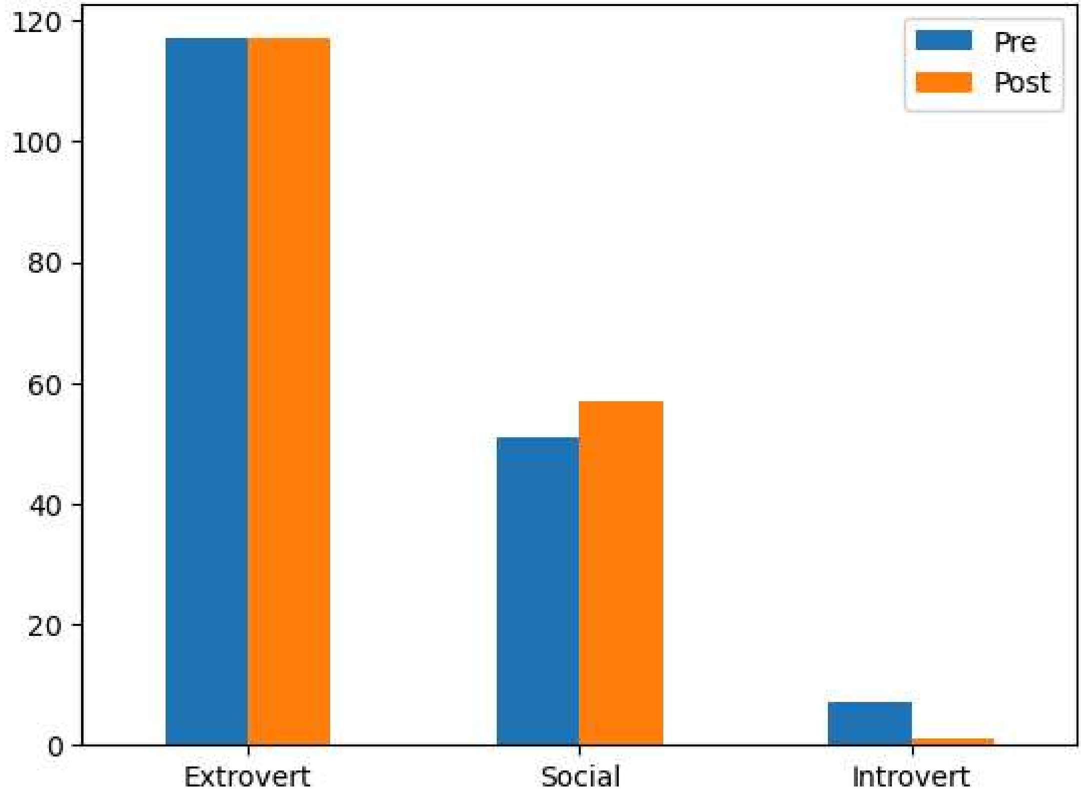
Out[30]:



In [33]:
```
social_relationships_table = pd.DataFrame({"Pre":Counter(data_social_relationships_1),
social_relationships_table.plot.bar(rot=0)
```

Out[33]:
```
<AxesSubplot:>
```



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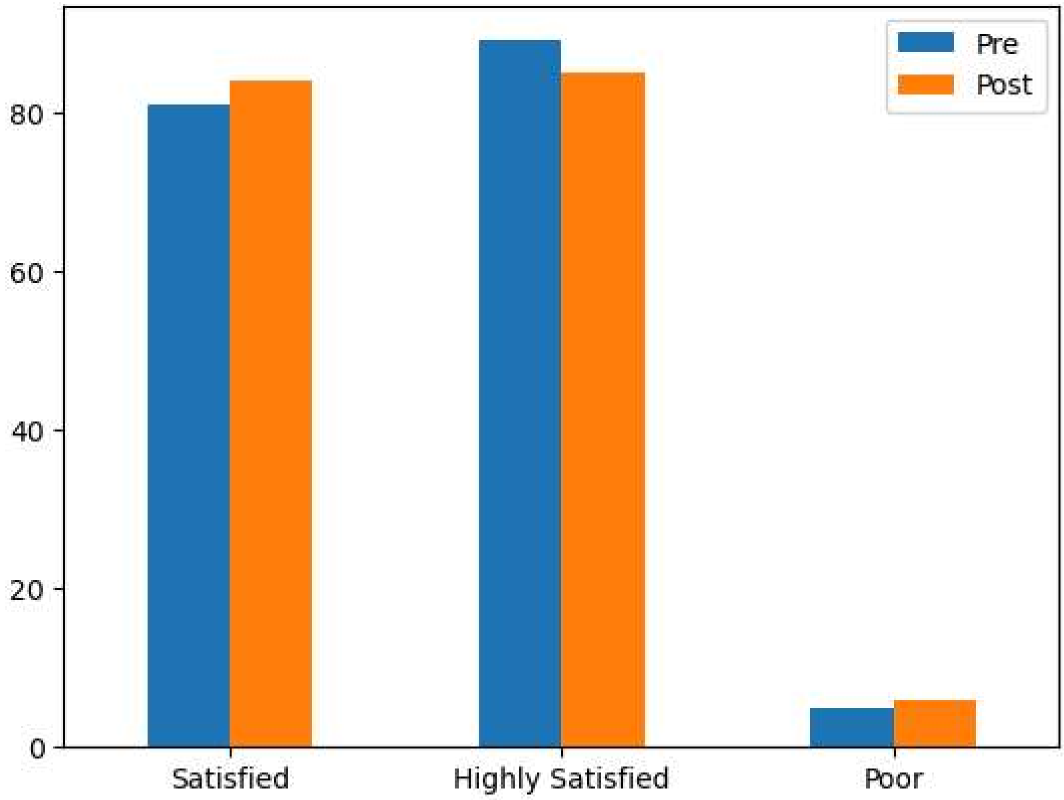
```
elationships_table = pd.DataFrame({"Pre":Counter(data_environmental_rel
environmental_relationships_table.plot.bar(rot=0)
```

```
Out[35]: <AxesSubplot:>
```



```
In [ ]:
```

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